(12) UK Patent Application (19) GB (11) 2 209 787 (13) A

(43) Date of A publication 24.05.1989

(21) Application No 8721834.3

(22) Date of filing 17.09.1987

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(51) INT CL*
E06B 7/14

(52) UK CL (Edition J)
E1J JGH

(56) Documents cited
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(58) Field of search
UK CL (Edition J) E1J JGH

(54) Condensation drainage

(57) A drainage system consists of a collecting gallery (2), drain point (1) and drain tube (4), to continuously collect and drain liquid due to condensation, on a window, to a safe place, protecting against damage to health, furnishings, buildings and equipment. Variations are described, including a heated tube.

FIG.1.

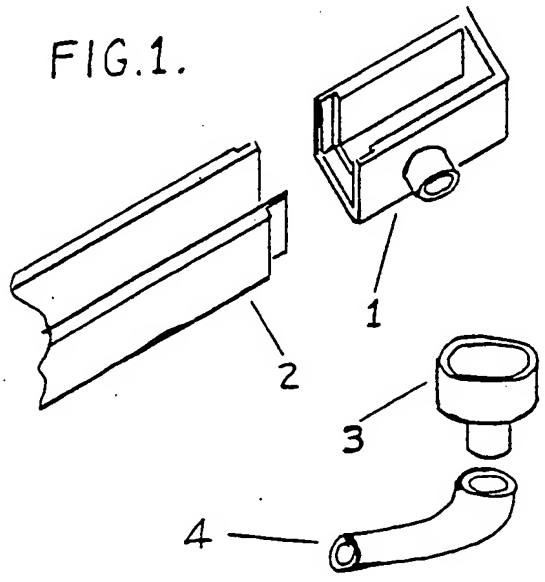

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FIG.1.

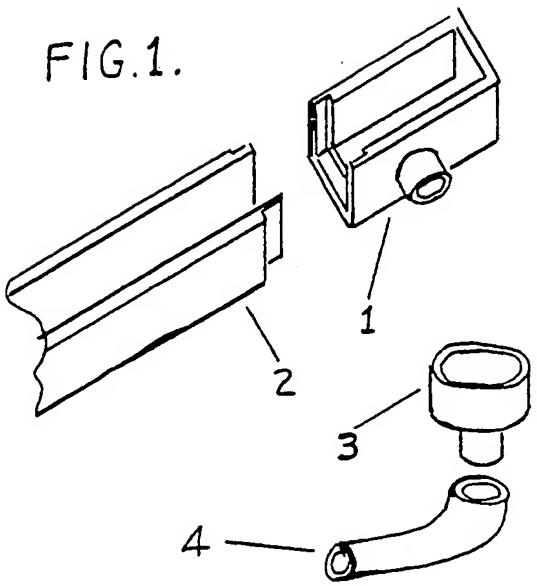


FIG.4.

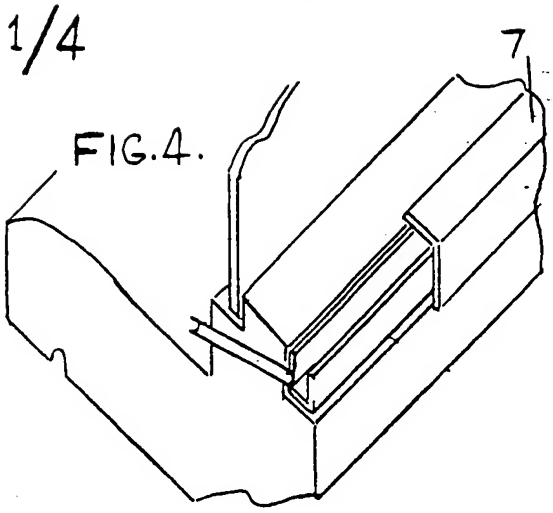


FIG.2.

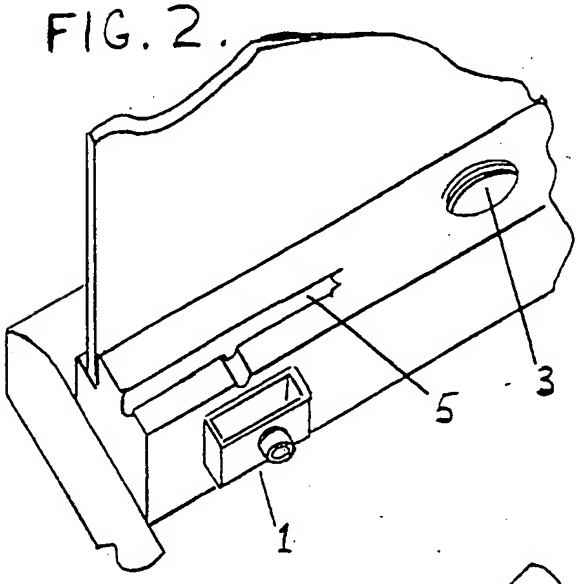


FIG.5.

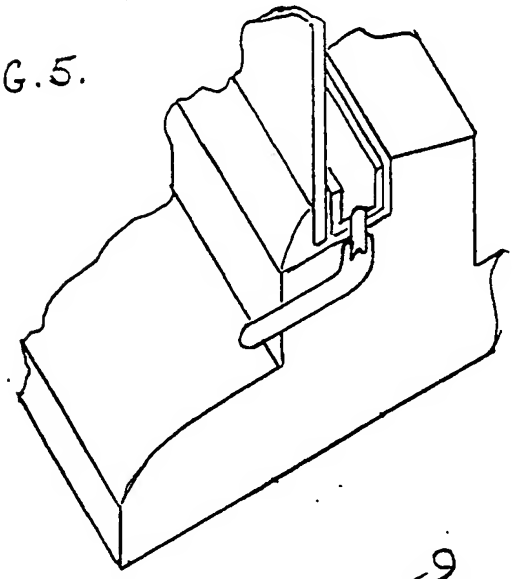


FIG.3.

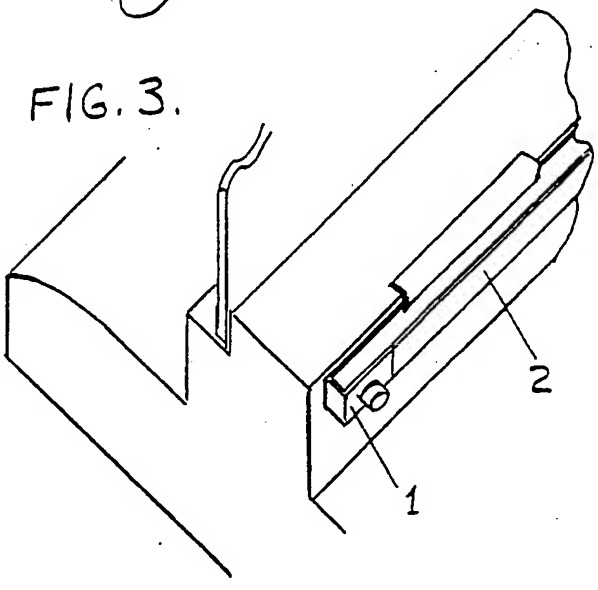


FIG 6

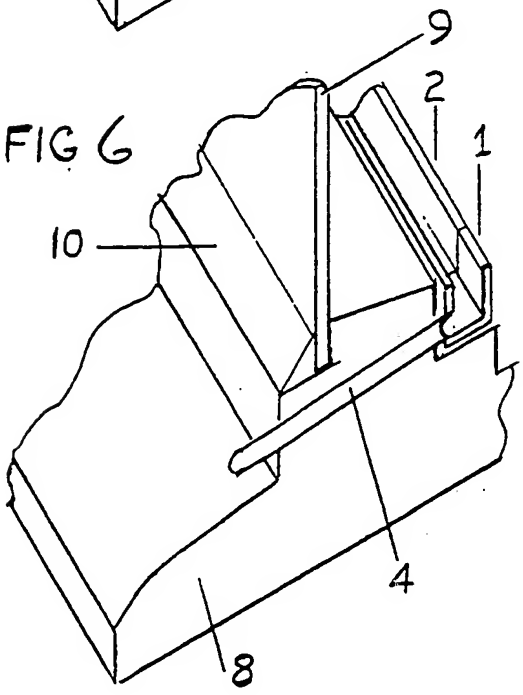
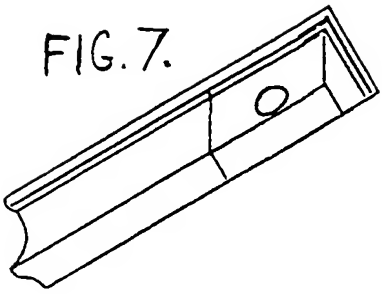


FIG.7.



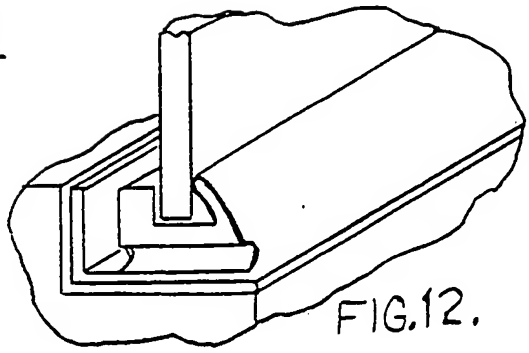


FIG.12.

FIG.8.

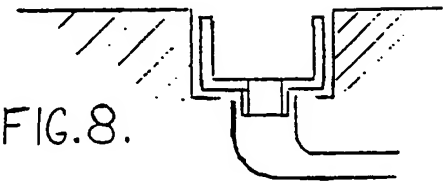


FIG.13.

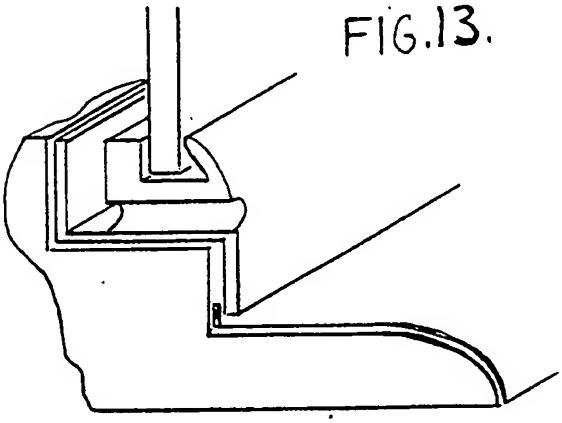


FIG.9.

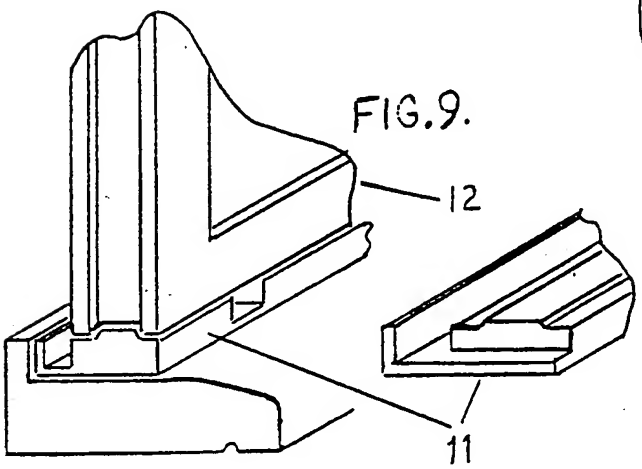


FIG.14.

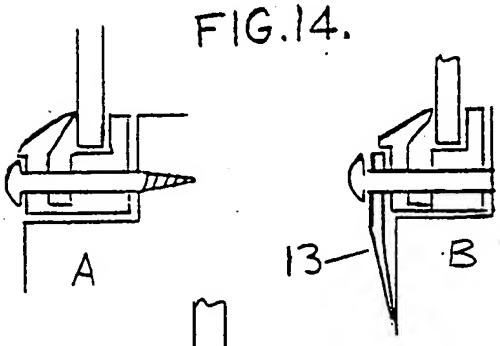
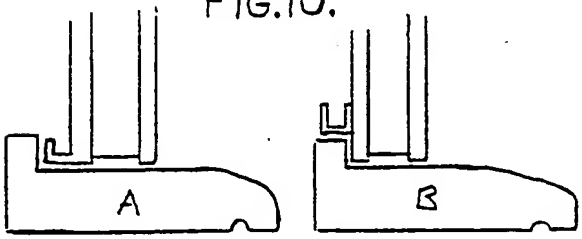
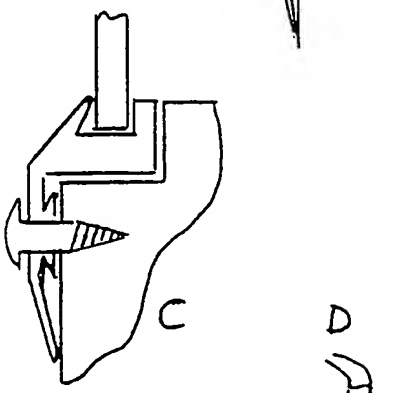


FIG.10.





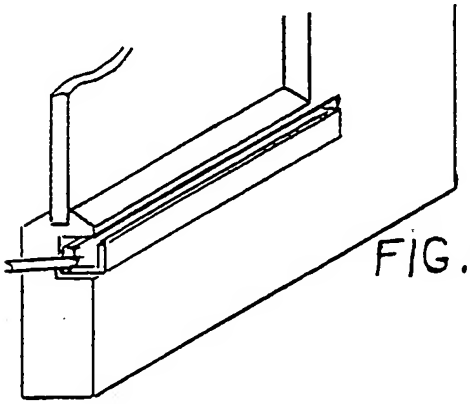
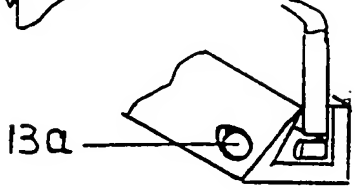


FIG.11.



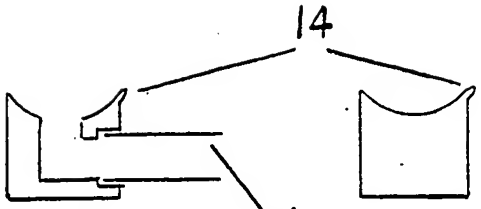
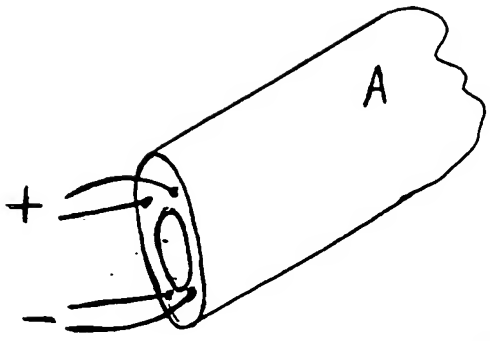


FIG.15.



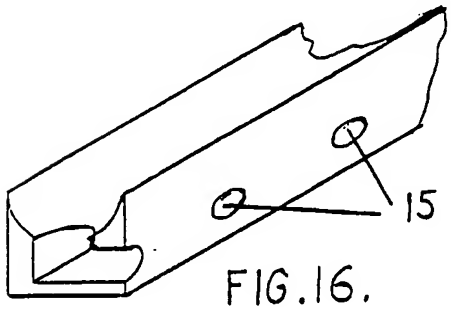


FIG.16.

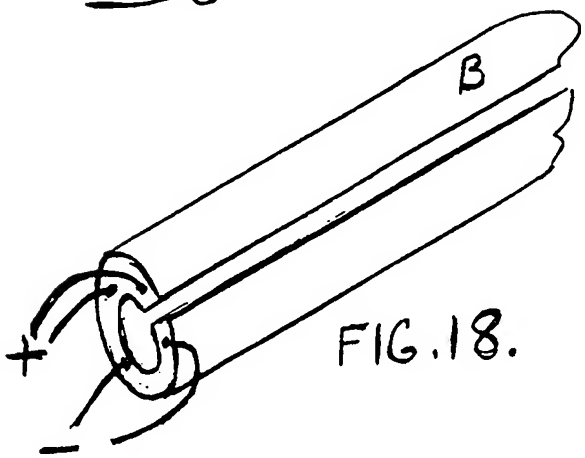


FIG.18.

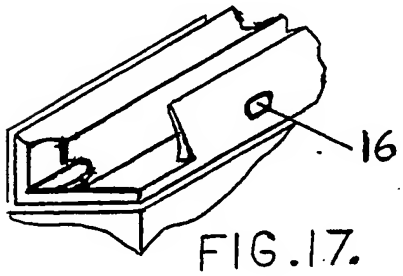


FIG.17.

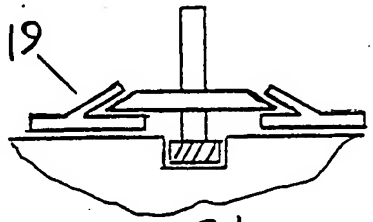


FIG 21

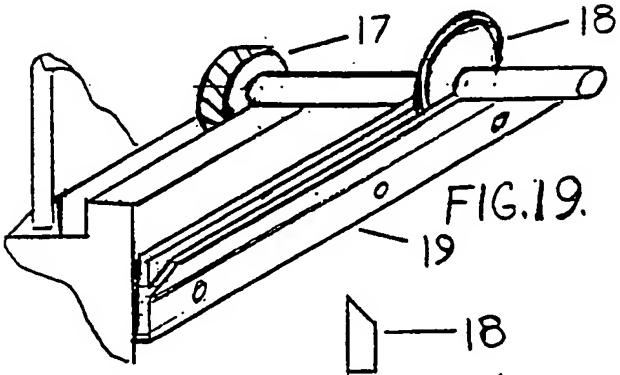


FIG.19.

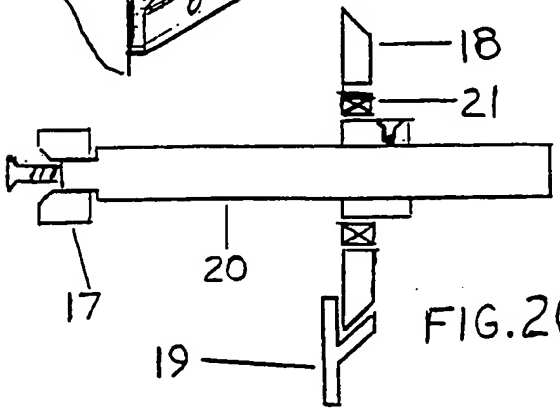


FIG.20.

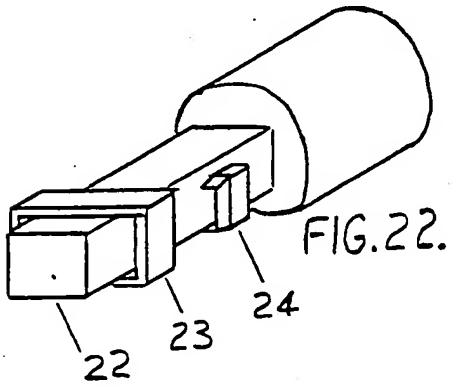


FIG.22.

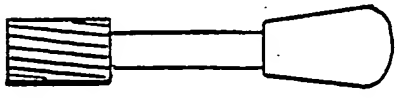


FIG.23.

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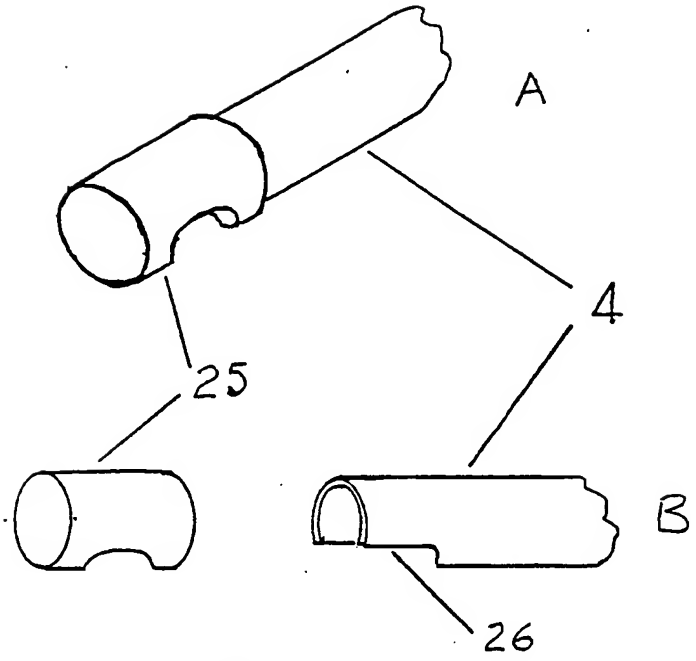

FIG. 24

CONDENSATION AND WATER LEAKAGE CONTROL SYSTEM

This invention relates to a system for the control of condensation or water leakage by continuous draining, with or without external weather protection.

The problems of excess humidity condensing into water and running down windows, or other surfaces resulting in damage to furnishings, window frames, walls, floors, building structures and even health are well known.

Present methods of dealing with window condensation include moisture absorbing crystals, troughs and sponge strips, which hold their maximum amount of water until manually drained or dried out. Any excess over the maximum is absorbed by furnishings and building. Double glazing can reduce condensation on glass doors and windows, but the excess humidity remains in the air, condensing into water, in other, possibly less manageable and more damaging places. The only really effective method of control has been dehumidifying machines, which are expensive and additional machines may be required, when it is desirable to maintain different sections of a building at different temperatures.

Research I have carried out over the last three winters, show that in a centrally heated double bedroom of 25 cubic meters, occupied by two adults, a single glazed window can yield up to 0.5 litres of drained off water, per square meter of glass, per eight hour period, due to condensation alone. The introduction of four of the crystal type moisture absorbers on the window sill, produced no measurable reduction in the amount of water produced. Other rooms with higher occupancy levels, or additional sources of humidity can produce much more.

This patent application covers a method of controlling the liquid produced by condensation, leakage, or other source, on windows, doors, walls, floors, or other surface by continuously draining either externally, when no further attention is required, or internally, when a drain tube run into a suitable drain, or container will be required. Installed in the external drain position, a degree of trickle ventilation is introduced, through the drain tubes or slots helping to control condensation naturally.

Drainage is achieved through a round or rectangular drain point and tube. The liquid can be channelled to the drain point via grooves or collecting galleries. In the case of collecting galleries, connecting straights,

tees and crosses will permit joining galleries from other directions. A heavy duty version of collecting gallery, can be drilled, to give integral drain point and also to permit screw fixing. On new windows and doors, the system can be added after manufacture, included as an integral part of the frame section, or placed between frame and sill, at the time of installation. Another variation includes exterior protection, with an alternative to putty glazing combined, or separate. A drill attachment, for easy cutting of concealing grooves, together with tools for trimming standard collecting galleries and for boring drain passages in heavy duty galleries, are included. Collecting galleries and drain points could be manufactured in any size, according to the volume of liquid to be drained.

Drain tubes with heating conductors and draught excluding caps, can be used when strong winds and extreme low temperatures are prevalent.

The invention will now be described by way of examples with reference to the accompanying drawings in which:-

Figure 1 shows a rectangular drain point (1) with one end blank removed and about to be connected to one end of a section of collecting gallery (2). Also shown is a round drain point (3) about to be connected to a drain tube (4).

Figure 2 shows a rectangular drain point (1) attached to a window frame in the internal drain position with grooves (5) cut into the wooden frame to channel water into the drain point. Farther along the frame is shown a sunken round drain point, which could also be fed by grooves if required and drains through drain tube (not shown), either externally or internally.

Figure 3 shows a rectangular drain point (1) and collecting gallery (2) in the internal drain position, taped onto a window frame. The tape would run along the whole length of gallery and drain point, to attach and also lead the liquid into the system.

Figure 4 shows a rectangular external drain system, sectioned through the drain and fitted to a window in the rear concealed position, after a concealing groove has been cut. Farther along the gallery a concealing strip (7) is shown, which can be clipped onto the gallery, or fixed to the frame.

Figure 5 as Fig 4, but in the forward concealed position with bottom drain point and without concealing strip.

Figure 6 shows an alternative view of rectangular side drain (1) and collecting gallery (2), mounted in the rear concealed position, sectioned through the drain tube (4), which drains externally onto the window sill (8), below the window glass (9) and putty seal (10).

Figure 7 shows a rectangular system in a sunken position, as it would appear on a surface such as a floor, or internal window sill.

Figure 8 shows a cross sectional view of a round drain point, as it would be when installed in a floor, draining through drain tube. A cross section of a bottom drain rectangular drain point, would appear the same. The fit between the sides of the drain point and surround, is shown loose, for clarity (as are other drawings) and would of course be a tight sealed fit.

Figure 9 shows a sectioned view of the system in the form of a spacer (11), as it would be fitted between a door/window frame (12) and sill. A closer view of the system, sectioned through a drain slot, after the slot has been cut through to the collecting gallery, is also shown.

Figure 10 shows cross sections of collecting gallery as an integral part the frame bottom section (A), and as an add on attachment (B). This would be suitable for use on UPVC or metal frames and drainage would be achieved, either through straight through drain tubes to outside, or by draining into the frame section and then out, via the frame drainage slots normally provided.

Figure 11 shows collecting gallery and external drain point, sectioned along the drain tube, as it could be installed in a part concealed position, on a glazed wooden door. This method would also be suitable for some windows.

Figure 12 shows a sectioned view of the drainage system combined with an alternative to putty glazing.

Figure 13 shows as for Fig 12, but with the addition of exterior protection. The sill protection would be manufactured as a separate loose part which may or may not be fitted.

Figure 14 A, B and C, show cross sectional views of purely alternatives to putty glazing. The exterior protection (13), in (B), is an add on part, while in (C), alternative glazing and exterior protection form one complete unit. Another alternative is shown in (D), where the glazing would be fixed internally to the

frame, glass fitted and locked in position, by inserting a locking peg through hole (13a), which would then be plugged and sealed. A similar locking arrangement would be applicable to Fig 12 and 13.

Figure 15 shows two cross sectional views of a heavy duty collecting gallery, which can be fixed by screws. One view shows the gallery before any work has been carried out and the other view, after the drain passage has been bored and drain tube (4), fitted. The lip (14) will ensure a water tight lead into the gallery on most surfaces, but for harder surfaces, or where screw fixing is not practical, a suitable bonding/sealer would be used.

Figure 16 shows another view of a heavy duty gallery, sectioned through the drain passage and also shows holes (15), which have been drilled for screw fixing.

Figure 17 shows the heavy duty style collecting gallery, combined with alternative to putty glazing. The glazing has been cut away to reveal the drain passage and holes (16), would be necessary to drain water outside from the glass section and to fit glass locking pegs.

Figure 18 shows an alternative drain tube with longitudinal conductors, to provide trace heating in low temperatures and in (B), the tube has been cut to allow it to be fitted over a metal pipe.

Figure 19 shows a drill attachment tool being used to machine a concealing groove, in which the cutter (17) cuts the groove and guide wheel (18) and guide rail (19) maintain position and line.

Figure 20 shows a cross sectional view of the drill attachment where 17, 18 and 19, are as Fig 19, and (20) is the rotating drive shaft and (21) a bearing to allow the guide wheel (18) to remain stationary, while drive shaft and cutter rotate.

Figure 21 shows the drill attachment in cross section, as it would be used to machine a groove in a horizontal surface such as a floor. An additional guide rail (19) gives more control.

Figure 22 shows a tool for trimming the ends of rectangular collecting galleries, to fit drain point, in which centre guide (22), fits inside the gallery, outer guide (23), passes around the outer perimeter of the gallery and cutting blade (24), shaves off the required amount of material.

Figure 23 shows a boring tool for boring drain passages in heavy duty collecting galleries and has an interchangeable cutter, for counter boring the drain passage to fit the drain tube.

Figure 24 has views of a draught excluding cap (25) fitted to an external drain tube (4) (View A). View (B) has separate views of drain tube (4) with a drain slot (26), cut into the end of the tube, pointing downwards and corresponds with the hole in the draught excluding cap (25). If required the cap can be rotated to close drain hole.

Referring to the drawings the drainage system comprises a round drain point (3), or a rectangular drain point (1), which drains liquid fed into it via a groove (5), or gallery (2) and then into a container, an internal drain, or outside, through a drain tube (4). In external drain system (Fig 4, 5 and 6), a hole is drilled through the frame to pass through the drain tube.

Drain grooves and concealing grooves (3, 4, 5 and 6), can be cut using tools already available, or with the drill attachment (Fig 19, 20 and 21), in which the cutter (17) can be changed to carry out a wide range of cutting tasks. The guide rail (19) will be fixed by three, or more screws and the rail slotted, enabling the line of the groove to be maintained when cutting extended grooves, as the rear screw would be removed, guide rail moved forward and screw replaced in forward position. The version shown in Fig 12, for use on new windows, or when reglazing old ones, combines a collecting gallery with an alternative to putty glazing. Drainage holes are cut into the glass support section, connecting the collecting gallery to the outside edge. It could be used on all sides, or on only the bottom, which is more susceptible to weather damage. This system could also include exterior protection and separate sill protection, as shonw in Fig 13.

The alternatives to putty glazing, without the drainage system, see Fig 14, can include exterior protection as an add on piece (13), or manufactured as a complete unit, see diagram (C). Still referring to Fig 14 (C), this could be manufactured without the glass channel, for the sole purpose of providing exterior protection for the putty seal and surrounding woodwork.

Other typical variations of the drainage system can be seen in Fig 9, which would be suitable for use on UPVC, or metal door/window frames, at time of installation. The combined collecting gallery/spacer (11) would be a

one piece extrusion, with drain slot cut into the solid spacer section, draining the gallery to outside. For existing frames a gallery can be fixed separately, Fig 10 (B) draining either, through straight through drain tubes, or simply draining into the frame section and then outside, through the frame drain slots normally provided by the manufacturer. Alternatively for future frames, the collecting gallery could be manufactured as an integral part of the frame bottom section, as in Fig 10 (A).

Drain tube (Fig 18 A) is for use in extreme low temperatuees, where prolonged freezing would prevent satisfactory draining. The tube which has longitudinal heating conductors, would be cut off to the required length and conductors joined at one end to complete the circuit and the other end separated into live and neutral terminals. The tube could be manufactured in a wide range of sizes and also to withstand pressure, for use where it is essential for fluid flow, to maintain the internal liquid above a certain temperature. Locating conductors closer to the tube bore, than the outside diameter, will insulate against heat escaping. If manufactured to serve the purpose of a hose or pipe, this could be expected to offer savings in terms of material, running and installation costs, over conventional metal pipe and trace heating. When cut along one side (Fig 18 B) it can also be fitted in a similar way, to plumbing pipe foam insulation, to provide trace heating for metal pipework. A draught excluder cap (25) Fig 24, would fit over the external end of the drain tube, for use where strong winds are prevalent.

Referring back to Fig 2, 3, 4 and 5, there are many instances where the water naturally runs off at one place, in which case galleries and grooves are not required, a drain point will do the job.

CLAIMS

1. A system for controlling the liquid produced by condensation, leakage, or other source, in which the central feature is a continuous drain point to drain liquid away from any area, where there is potential for damage to health, property, or equipment, if not properly drained away, via a drain tube.

2. A system as described in Claim 1 with the addition of a collecting gallery, which can be slotted into the drain point, or other sections of gallery with connecting straights, tees and crosses.

3. Method of concealing the gallery and drain point system referred to in Claim 2, in floors, walls windows or doors, by concealing grooves and concealing strip.

4. A collecting gallery as in Claim 2, but manufactured to include an exterior protection and alternative glazing system, for use on doors and windows.

5. An exterior protection combined with alternative glazing as in Claim 4, but exlcuding the interior collecting gallery and drainage.

6. An exterior protection system as in Claim 5 but designed to either substitute the putty seal, or only to protect the existing putty seal and surrounding woodwork.

7. Collecting gallery system as claimed in 2, but designed to fit UPVC or metal door/window frame and drain outside through straight through drain tube, or to drain into the frame section and then outside, through the frame drainage slots.

8. Collecting gallery and drainage as Claim 7, but designed as an integral part of the frame bottom section.

9. Collecting gallery as Claim 7, but designed in the form of a spacer to fit between frame and sill at time of installation, drainage from collecting gallery to outside is by way of a drain slot, cut through the spacer section.

10. A collecting gallery as in Claim 2, but of heavy duty construction, to allow drilling and screw fixing and the boring of drain passages within the base of the gallery.

11. Flexible drain tube as referred to in Claim 1 but with the addition of longitudinal conductors to provide low heat, for use in extreme low temperatures, also claim this design for use as hose, pipe, or to provide trace heating on metal pipework.

12. Drill attachment and guide rail for cutting the concealing grooves referred to in Claim 3.

13. Tool for trimming the ends of collecting gallery to fit straights, tees, crosses and drain points as referred to in Claim 2.

14. Draught excluding drain tube external caps, to fit standard drain tube and the special drain tube referred to in Claim 10.

15. The idea and method of collecting, draining and measuring, the amount of water produced and drained off a glass or other surface, due to condensation, under different conditions, and the use of the information obtained from such research.

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